AN INSTRUMENT DEVELOPMENT MODEL FOR ONLINE SURVEYS IN HUMAN RESOURCE DEVELOPMENT AND ADULT EDUCATION

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Abstract

This article describes the use of a schematic model for developing and distributing online surveys. Two empirical studies that developed and implemented online surveys to collect data to measure satisfaction in various aspects of human resource development and adult education exemplify the use of the model to conduct online survey research. The steps of the model used for online survey development and implementation, descriptions of the two case studies, and recommendations for the use of online surveys are presented.

The gathering of feedback is an important part of educational program development and workforce development in general. It is critical that human resource development (HRD) practitioners and adult educators are able to gauge the success of their efforts from the viewpoints of a wide variety of stakeholders. One of the best ways to gather learner, employee, and consumer feedback for research, evaluation, and continuous improvement is through the use of surveys. Telephone surveys or hard-copy surveys, mailed or manually distributed to potential survey respondents, have traditionally been used to gather survey data. In the age of the Internet, however, online surveys can be an efficient way to gather data as well (Strachota, Schmidt, & Conceição, 2005).

Despite the myriad of opportunities offered by the Internet, survey researchers have not been leaders in the use of Internet-based surveys. In fact, Dillman and Bowker (2001) note:

> the use of web surveys seems to have caught the survey methodology community somewhat by surprise. Leadership for the development of web survey procedures has come in large part from computer programmers, many of whom have little or no training in survey methodology. ..rather than being at the forefront of this latest innovation in the conduct of social surveys, survey methodologists are playing catch-up as they learn to master these new survey development tools. (p. 1)

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Using the Internet as a data-gathering tool adds extra layers of complexity to the process of survey development. Gunn (2002) suggests that "unlike other types of surveys, web page design skills and computer programming expertise play a significant role in the design of web-based surveys" (p. 1). These challenges have been made somewhat easier by the development of websites specifically geared to help researchers develop and distribute online surveys. Websites such as SurveyShare.com, SurveyMonkey.com, and Zoomerang.com allow researchers to set up online surveys in a matter of minutes. Many of these sites offer distribution, tabulation, and reporting features as well.

Statement of the Problem

Gathering data online for research projects has become easier provided that the available tools are used properly. However, researchers must be aware of additional considerations associated with the use of online surveys that should be addressed as part of survey development and distribution processes (Strachota et al., 2005). This article suggests the use of a schematic model for developing and distributing online surveys. This study addresses the following research questions:

a) How can online surveys effectively be used to gather data for evaluation and research within the fields of HRD and adult education (AE)?
b) What are the benefits and limitations associated with the use of online surveys related to HRD and AE evaluation and research?
c) What factors regarding survey development and distribution must be considered when surveying in an online environment?

This article will contribute to the body of knowledge on online survey development, which will help practitioners and researchers in the fields of HRD and AE. Two empirical studies that developed and implemented online surveys to collect data to measure satisfaction in various aspects of HRD and AE exemplify the process used to conduct online survey research. A description of each study, the steps used in online survey development and implementation, and recommendations for the future use of online surveys are presented.

Model Foundation

The schematic model presented in this work, the Model for Online Survey Development is based on the work of Dillman and Bowker (2001), Dillman, Tortora, and Bowker (1998), Rea and Parker (1997), Wallen and Fraenkel (2001), and their contributions to survey development. Wallen and Fraenkel's (2001) process includes the definition of the problem, identification of the target population, determination of mode of data collection, preparation of the instrument, collection of data, and analysis. Also important in their process of survey development is the identification of large categories of issues (or constructs), which can be used to suggest more specific issues within each category, which can then be used for question development. Rae and Parker's (1997) stages of the survey research such as the importance of the literature review, construct development, and validity checks were incorporated into the model. Works by Dillman et al. (1998) and Dillman and Bowker (2001) form the theoretical bases for the online components of the online survey development and distribution model.

Online Survey Development Model

This article describes an effective model for online survey development (see Figure 1). Two case examples will illustrate the process for the online survey development model. The first case is in the context of HRD, specifically corporate job training, and the second case is an AE program offering online courses for adult learners in a technical college.

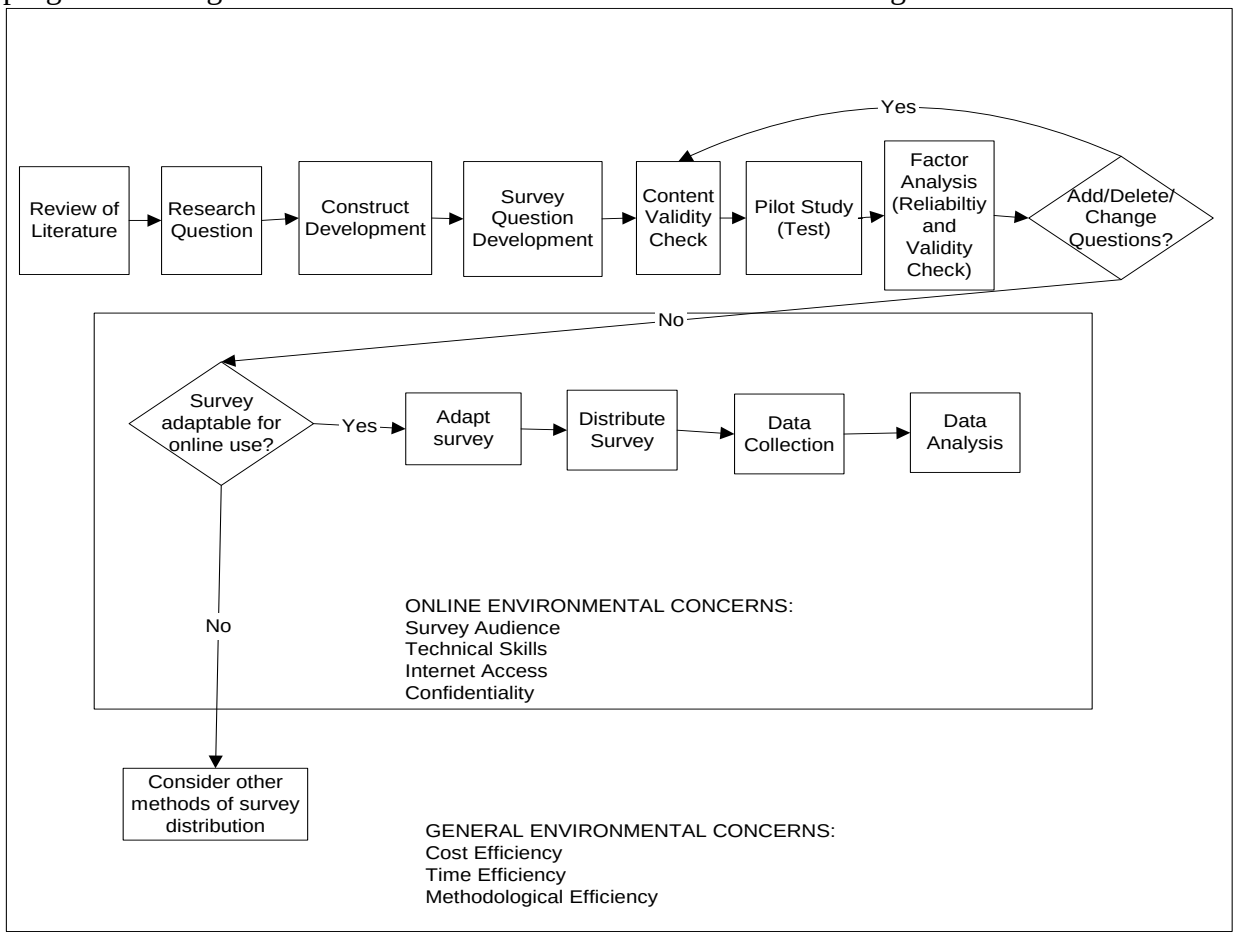

Figure 1. Model for Online Survey Development

Steps One and Two: Review of Literature and Research Question Development

The first step in the research process is to determine the significant aspects of a research problem that call for investigation. A review of the literature can assist in clarifying issues and framing problems more clearly. Research questions based on the literature are then developed (step two) and serve as the foundation of inquiry for the survey instrument. Wallen and Fraenkel (2001) suggest that good research questions should be realistic and actually researchable by the researcher; they should be clear, significant, ethical, and suggest a relationship of some sort. Hypotheses may also be tested using this model. Hypotheses may be stated as such, or they may be stated in question form.

Step Three: Developing and Defining Constructs

A construct is a concept measured by multiple items in a survey instrument. Following the development of the research question, the researcher compiles a list of key issues or constructs that comprise the research questions. Each construct must be defined and clearly differentiated from other constructs.

Creating an original survey instrument requires a theoretical foundation in the area of study. The literature review noted in step one serves as the foundation for construct development. The literature review will assist the researcher in understanding and appreciating the depth of research in a given field, such as HRD or AE, as well as in realizing those areas that continue to require further research.

Rather than rely on personal opinion, and in order to ensure content validity, which will be addressed later in this process, the researcher should organize a team of experts to assist with construct development (Trochim, 2002). Rea and Parker (1997) recommend that such a team "represents both technological expertise and substantive knowledge of the political, socioeconomic, and cultural environment associated with the project" (p. 28). Working with the above resources, the researcher formulates constructs based on past research and on the team's feedback, with the constructs adding to the field of study by supporting existing theory and practice, and also by creating new directions for theory and practice.

Step Four: Survey Question Development

Based on the constructs developed and defined in step three, a set of survey questions are developed. Ideally each construct should have a minimum of three to five questions that measure that construct. Developing more questions for a particular construct is preferred over not having enough questions, as questions are often eliminated as part of the factor analysis statistical process (Gable & Wolf, 1993; Strachota, 2003). Rea and Parker (1997) note the following tips for survey question development:

1. Keep in mind the population to be surveyed when choosing words, colloquialisms, and jargon for survey questions.
2. Make every effort to avoid ambiguity or vagueness in writing survey questions.
3. Avoid multipurpose questions, or questions that request one response for two or more issues.
4. When developing explanatory statements or survey directions, take care to avoid manipulative or biasing information.
5. Be mindful of the use of bold, italicized, capitalized, or underlined words, which may place inappropriate emphasis on those words, thereby biasing responses. The use of emotional words and phrases may do the same.

During the investigative process, existing survey instruments may be found, and used when appropriate. Many survey instruments, however, may not be adequately grounded in theory and practice or not designed to adequately answer intended research questions. The validity and reliability of the survey instrument is also important, or the data collected is of little value. For these reasons the researcher may find that creating an original survey instrument is necessary.

Case Examples of Survey Question Development (Step Four)

In Case 1, a study by Schmidt (2004a) employed the use of an existing survey instrument. The job satisfaction aspects of this survey originate, in part, from Paul Spector's (1997) 36-item, nine-factor Job Satisfaction Survey. Spector's nine subscales (or constructs) measure satisfaction with pay, promotion, supervision, fringe benefits, contingent rewards (performance-based rewards), operating procedures (required rules and procedures), coworkers, nature of work, and communication. There are four questions for each subscale. Spector's survey was used because it was a well-tested and readily available existing instrument that measured the topic (job satisfaction) of interest to the researcher.

In Case 1, the Job Training facets of Schmidt's (2004a) survey *Job Training and Job Satisfaction Survey* measured employee satisfaction with on-the-job training. The three subscales (or constructs) measured organizational support for training, employee feelings about training, and employee satisfaction with training. Specific questions for each of these constructs were developed by Schmidt (2004a) based on learning organization assessments (Wick & Leon, 1993). Four questions were developed for each subscale. Schmidt's (2004a) survey also contained five questions regarding training methodology, training content, and time spent in training. Seven demographic questions were included as well.

The original survey instrument developed by Strachota (2003) for Case 2 included 33 questions. Nine questions measured the construct of learner-content interaction. Learner-instructor interaction, learner-learner interaction, and general satisfaction were each measured by eight items, respectively. A four-point Likert scale was used. Selected questions were obtained from the Cassidy and Eachus (2000) computer self-efficacy instrument to measure learner-technology interaction. In addition to the constructs that were measured, the survey instrument included a rank-ordering question. Students had to rank-order the following: learner-content, learner-instructor, and learner-learner interaction as to which they perceived as 1 (*the most important*), 2 (*moderately important*), and 3 (*least important*) to a satisfying online experience. Following the rank ordering was an open-ended question asking students why they ranked a particular construct as most important. Four additional open-ended qualitative questions were included in the instrument specific to online learning. Eleven demographic questions were also included.

Steps Five Through Seven: Validity Check, Pilot Study, and Factor Analysis

The validity of an instrument is concerned with the question, "Does the instrument measure what it is supposed to measure" (Gable & Wolf, 1993, p. 95). Wallen and Fraenkel (2001) state that "validity is the most important idea to consider when preparing or selecting an instrument for use" (p. 88). Validity includes the appropriateness, meaningfulness, and usefulness of specific inferences made by the researcher based on data that are collected (Wallen & Fraenkel, 2001). The degree to which those inferences are correct or appropriate is dependent on the validity of the research instrument. An effective instrument must have both content validity and construct validity. Content validity, step 5 in Figure 1, or what is often referred to as face validity, is judgmental in nature and is measured by having experts in the field examine the instrument to ensure that all test items appear to address the purpose of the instrument and the variables that are to be measured. As noted in step 2 (above) the same team of experts that

advised the researcher on construct development should be called upon to determine if any of the questions are unclear, to modify items, to eliminate items that do not appear to be a measure of a given construct, and to create additional items if necessary. Once the instrument has established content validity a pilot study of the instrument, step 6, should always be conducted. Factorial analysis of data from the pilot test will assist in determining construct validity.

The purpose of construct validity is to determine if the constructs being measured are a valid conceptualization of the phenomena being tested. Construct validity is determined from the data analysis of the instrument. According to Gable and Wolf (1993), "construct validity focuses directly on response-data variation among items to ascertain evidence that the proposed content categories actually reflect constructs" (p. 101). Construct validity is empirical in nature and is a critical step in the process of establishing instrument validity. Data from the pilot study are analyzed through the use of factor analysis, step 7, to determine if indeed given items load on the intended construct. Items that do not load on the intended construct are eliminated, as they are not an adequate measure of that construct. Therefore, administration of a pilot study is critical to the validity of the final instrument. According to Gable and Wolf (1993), "factor analysis is used to examine the relationship between judgmentally developed content categories and the empirically derived constructs" (p. 106).

Instrument reliability is concerned with the question: "Does the instrument provide us with an accurate assessment of the affective characteristic?" (Gable & Wolf, 1993, p. 201). Reliability refers to the consistency of scores or answers from one administration of an instrument to another and from one set of items to another (Wallen & Fraenkel, 2001). Conducting a pilot test of the survey instrument will also determine its level of reliability or Cronbach's alpha, an internal consistency or reliability coefficient for instruments requiring only one test administration (Wallen & Fraenkel, 2001). Internal consistency reflects the degree of homogeneity between test items such that items are a measure of the same construct. Cronbach's alpha scores range from zero through one, with a coefficient closer to one indicating higher reliability. Reliability coefficients should be at least .70 or higher to be considered reliable for affective instruments (Gable & Wolf, 1993; Wallen & Fraenkel, 2001). A survey instrument must demonstrate both validity and reliability to be considered an effective measurement tool.

Case Examples of Validity Check, Pilot Study, and Factor Analysis (Steps Five-Seven)

In order to ensure validity of both the Case 1 (Job Training and Job Satisfaction) and Case 2 (the Online Satisfaction) survey instruments, the following steps were taken: experts within the field reviewed instrument items for clarity, precision, and revision to ensure content validity. Following content validity, a pilot study was conducted by both researchers to test their instruments for construct validity. Using the data obtained through the pilot study, a factor analysis was performed to evaluate the factor loading of the constructs within each instrument. Although pilot testing an instrument is critical to the process of developing a valid instrument, this step unfortunately is often eliminated. However, it is the step that ensures that the instrument truly is an accurate measure of what it is intended to measure. Items that do not factor load under the intended construct should be eliminated as they are not an effective measure of that construct.

A pilot study (N=118) was conducted for the Job Training and Job Satisfaction Survey. Inappropriate questions were deleted based on information collected in the pilot, and when

combined with questions regarding job training, the factor structure of Spector's (1997) original Job Satisfaction survey differed slightly from that of the original. A six-factor solution was obtained rather than the eight constructed by Spector (1997). The original subscales of satisfaction with pay, promotion, and contingent rewards were combined to form a single subscale that was called "Satisfaction with Opportunities and Rewards." Another subscale, "Satisfaction with Communication," was removed entirely. The remainder of Spector's original subscales engendered a relatively clean factor structure with limited overlap between the scales. Reliability testing of the pilot study indicated a Cronbach's alpha of .89 for the revised job satisfaction scale and a Cronbach's alpha of .83 for the job training scale.

The same pilot process was carried out for the Online Satisfaction Survey (*N*= 249). Through factor analysis the final instrument was reduced to 27 items as 6 items had low factor loading that overlapped across all constructs, indicating that they were not a good measure of that specific construct. The final instrument included seven items that were a measure of learner-content interaction, six items that were a measure of learner-instructor interaction, eight items that were a measure of learner-learner interaction, and six items that were a measure of general satisfaction. Removal of the six items resulted in moderate to high factor loading with the appropriate items loading within the specified construct. Therefore, questions within each construct were considered to have good internal validity. Reliability testing of the pilot study indicated a Cronbach's alpha of .90 for the constructs of both learner-content interaction and general satisfaction. The constructs of learner-instructor interaction and learner-learner interaction resulted in a Cronbach's alpha of .89. Items specific to learner-technology were not pilot tested as they had been piloted tested by Cassidy and Eachus (2000). They showed a Cronbach's alpha of .97 for the single construct of computer self-efficacy, which was equated as being synonymous with learner-technology interaction for the purposes of this study.

Step Eight: Adapting the Survey for Internet Use

The development of an online survey instrument begins with the design of the survey itself. While this process may not have changed with the advent of the web-based survey, factors in addition to those associated with traditional survey development should be considered when a survey is put online. Dillman et al. (1998) recommend that "questions must be presented in a way that they can be understood and answered accurately by all recipients. And, the likelihood of responding should not be affected by peoples' lack of computer skills" (p. 3). To address these issues, Dillman et al. (1998) advise online survey developers to consider the following:

1. Survey design should be respondent-friendly and take into account the inability of some respondents to receive and respond to web questionnaires with advanced programming features.
2. Survey design should consider both the logic of how computers operate and how people expect questionnaires to operate.
3. As many survey populations do not have access to the Internet, a survey design should allow for survey use in other modes of data collection (i.e., paper questionnaires, interviews, or telephone surveys). It is also important to remember, from a reliability standpoint, that those other modes of data collection be administered using as many of the same guidelines as the online survey as possible (i.e., the time frames in which the surveys are administered and the location at which surveys will be completed should be similar for both online and non-online respondents).

Several additional factors should be considered when developing a survey for Internet use. Confidentiality must be protected in the data gathering process as well as in the data analysis process.

When determining the best way to distribute a survey, issues of cost, time, and methodological efficiency should be considered. The researcher must also consider issues associated with the distribution of web-based surveys to potential respondents. According to Timmerman (2002), participants are usually asked to participate in web-based surveys via e-mail messages, which often include a URL (Uniform Resource Locator) link to the survey website itself.

Case Examples of Adapting the Survey for Internet Use (Step Eight)

Case 1 (Schmidt, 2004a) and Case 2 (Strachota, 2003) followed the recommendations of Dillman et al. (1998) when developing their online surveys. To answer Case 1 research questions, a convenience sample of 552 customer and technical service employees in nine major organizations in the United States and Canada were asked to complete the Job Training and Job Satisfaction Survey. Organizations chosen for this study employ customer service and technical service representatives who provide service and support to either end (retail) customers or wholesale customers who both purchase and/or service the products or services provided by these organizations. All potential respondents used computers in their jobs, so the technical skills of the survey audience were considered to be at an acceptable level. Examination of the technology available to potential survey respondents revealed that several organizations that agreed to participate in the study did not provide Internet access for their employees. An alternate method of distribution was adapted in the form of a hard copy survey distributed manually to employees in those positions.

To answer Case 2 research questions, a convenience sample of 1,593 online students at a technical college in the Midwest area of the United States were given the Online Satisfaction Survey. Students were enrolled in various online courses as part of the program requirements for an associate degree in preparation for employment. The Online Satisfaction Survey was accessed through a web link in the college's Learning Management System (LMS) that hosts all online courses. All survey participants had access to the Internet either from home, work, or the college computer labs. All data were collected via an electronic format.

Step Nine: Survey Distribution

Surveys can be distributed in a variety of ways. They can be sent via traditional mail, conducted over the telephone, distributed in person to potential respondents, and sent via e-mail. As noted above, it is important to consider issues of cost, time, and methodological efficiency when determining the best method of survey distribution.

Case Examples of Survey Distribution

For Case 1, the Job Training and Job Satisfaction Survey was posted on an Internet survey website. Potential respondents with Internet access were e-mailed the survey link and asked to complete the survey online. Those without Internet access were given paper copies of

the survey. The researcher employed a procedure (Schaefer & Dillman, 1998) for sending e-mail invitations to potential survey respondents, a procedure regularly used by the Social and Economic Sciences Research Center. It consists of four contacts via e-mail:

a) A pre-message, requesting potential respondents to watch for the survey link.
b) A message that contains the link, along with survey instructions.
c) An e-mail thank-you note or a reminder, which also includes the link.
d) A final reminder, also with a link to the survey.

The researcher conducted this procedure over a 2-week time period. A total of 301 customer/technical service employees completed the Job Training and Job Satisfaction survey, for an overall response rate of 55%. Broken down by methodology, the researcher invited 263 employees to complete hard-copy surveys; 177 employees did so, for a response rate of 67%. The researcher sent 289 e-mail invitations to potential online respondents, and 124 invitees completed the survey online, for a response rate of 43% (Schmidt, 2004b).

For Case 2, the Online Satisfaction Survey was posted as a web link in the college's LMS, which houses all of the online courses. Each time a student would log into their course they would see the survey link. Besides placing the link in the LMS, the researcher also incorporated four e-mail contacts to students. The first contact included a pre-message requesting potential respondents to watch for the survey link in the LMS. One week after the link was posted in the LMS, an e-mail reminder message including the survey link and instructions was sent to all online students. The third contact included an e-mail thank-you note or a reminder, which also included the link. Following this e-mail message a final reminder was sent with the survey link. The researcher conducted this procedure over a 4-week period of time. A total of 849 students completed the Online Satisfaction survey, for an overall response rate of 53.3%.

These two empirical cases illustrate the benefits gained by following the processes identified in the Model for Online Survey Development. For both case studies, the online survey response rate exceeded the averages found by Sheehan (2001), who examined 31 online survey response rates from 1986-2000 and found the average response rate for those surveys to be 36.83%.

Recommendations for the Use of Online Surveys

The process of using online surveys for collecting data to measure satisfaction in job training and distance learning in two empirical studies allowed researchers to identify some advantages, limitations, and suggestions for the future use of online surveys.

Advantages of Online Surveys

When compared with traditional mail or telephone surveys, Schonlau, Fricker, and Eliott (2001) note that Internet surveys may be preferable to mail or telephone surveys when the survey contains questions of a particularly sensitive nature. The use of Internet-based surveys may allow the program developer to delve deeper into evaluation-related topics and result in more honest feedback than would traditional survey methodologies.

Advantages of online survey distribution also include increased time efficiency, decreased data entry error, increased item response rate, and decreased cost. Due to available technology, administration of online surveys has resulted in increased time efficiency in both distributing and receiving of survey results. The majority of colleges, universities, and businesses today that deliver distance learning courses and programs have invested in an LMS. The LMS is designed to allow for the posting of an announcement with a direct web link to an online survey instrument. The LMS offers efficiency for students who are enrolled in a course because they can access the survey instrument and complete it at a convenient time. The LMS also contains a database of e-mail addresses for all students. When the LMS is not available, the process becomes far more time-consuming as e-mail addresses must be obtained before a mass mailing can be conducted. Both of these methods, however, still remain far more time efficient than telephone or mail surveys.

Decreased data entry error is an important factor when conducting survey research. Traditional telephone and mail surveys require manual data entry. Electronic survey distribution does not require manual entry as data are collected through a given software program and then downloaded into a statistical program such as SPSS for detailed analysis. This feature saves time, is more accurate, and is especially useful when collecting data with a large sample size.

Increased item response rate can also be controlled through electronic surveys, as most of the software programs can be set so that all items must be completed before submission. Traditional mail surveys often are returned with data being absent in given fields. Further, qualitative item response rate can be increased due to the legibility of electronic responses versus occasional illegible mail responses. Schaefer and Dillman (1998) found that electronic surveys resulted in a quicker return rate, a slightly lower item non-response rate, and more complete answers to open-ended questions.

Another advantage of electronic survey distribution is decreased cost compared to telephone and mail distribution. A major concern of survey research is the potential for high non-response error. In order to minimize non-response error, multiple contacts are made to have participants complete a given survey. Schaefer and Dillman (1998) support the use of multiple contacts as a method for survey dissemination as it increases the response rate. Informing participants that a survey will be forthcoming through an announcement; presenting the actual survey link, a thank-you, or reminder e-mail with the survey link; and sending a final e-mail reminder with the survey link can all be entered in an LMS and/or e-mailed at no cost. Contacting participants multiple times through mail or telephone distribution, however, is far more costly and time consuming. Therefore, electronic survey distribution is a far more efficient and effective method for data collection and evaluation of educational and training programs.

Limitations of Online Surveys

The online survey must have user-friendly navigation. Certain computer skills such as selecting radio buttons, using drop-down menus, and scrolling are commonly required skills. Correctly reading the directions and paying attention to detail is also important. Dillman and Bowker (2001) identify the need to provide specific directions for each required computer action as well as any other necessary instruction to avoid frustration and termination of the survey before completion.

A potential limitation of e-mail survey research includes the difficulty in sorting out responders versus non-responders, especially with a large sample size. Annoyance may occasionally be perceived in those receiving multiple e-mails requesting a response. E-mail, like mail delivery, may be perceived as junk mail and deleted without responding. In order to achieve higher compliance among potential responders, some incentive should be established as part of the process. Incentives may include access to online books or reports of interest to potential respondents or small thank-you gifts (Strachota et al., 2005).

Conducting online surveys versus telephone or mail surveys is a good fit for those who use a computer as a common mode of communication as well as for those who enroll in online learning for career and job advancement. Although conducting online surveys is far more efficient and cost effective, it is important to recognize the audience being surveyed. Although we live in a technological age, we are still faced with the issue of Internet access. While 54.6% of the U.S. population has Internet access in their homes, and an additional 8.4% who do not have Internet access in their homes have access elsewhere, 37% does not have Internet access (Cooper & Gallagher, 2004).

Some topics, for reasons including those associated with sensitivity of subject and confidentiality of data collected, may best be researched via different means. Further, some research studies may be designed in such a manner that the researcher feels than mail or phone remain the better mode of delivery. Timmerman (2002) suggests that "before assuming web-based surveys are the most advantageous method for surveying a target population, it should be determined if those advantages exist within that population" (p. 5).

Suggestions for Future Use of Online Surveys

Survey distribution is a critical variable in the process of data collection. Online survey distribution typically involves the use of an e-mail message sent to potential respondents, which includes a link to the survey's URL. Following are seven recommendations for effective and efficient survey distribution using e-mail. These recommendations are based upon the authors' experiences with online surveys as well as conclusions made by other researchers:

1. E-mail address and list management is important. Be sure all potential respondents' e-mail addresses are complete and spelled correctly. This will reduce the number of undeliverable messages to be corrected and sent again.
2. Develop a method to track whether or not all potential respondents received the e-mailed survey invitation. Send test messages to a variety of people with different e-mail addresses (i.e., business or organizational addresses and personal addresses) before sending to potential respondents.
3. Creative and informative information in the e-mail subject line will prevent potential respondents from thinking that the researcher's e-mail message is spam or junk mail and simply deleting it.
4. E-mail filters used by many businesses and individuals may prevent e-mail messages from getting to potential respondents. Online survey websites such as those mentioned earlier have the advantage of allowing the researcher to send e-mail survey invitations to many people at once. However, e-mail filters may recognize the return address (which is often the survey website) as spam. This may cause the survey invitation to be diverted from potential respondents. Learn about any potential issues with filters ahead of time so

e-mail invitations can be sent in smaller quantities at one time (some filters filter out blanket e-mails sent to large groups) or sent to alternative e-mail addresses.

5. Ideally, survey respondents will access a web-based survey by clicking on a URL link in the body of the e-mail. Be sure all links work before sending them to potential respondents. Testing e-mail messages can be effective in ensuring a link works.
6. Have a backup to the URL link. Instruct survey respondents that if the link does not work, they can copy the link and paste it into the web address line. Also, provide instructions for accessing the survey by providing the website address to the online survey tool, along with instructions for respondents who go directly to the website (Schmidt, Strachota, & Conceição, 2005).
7. E-mail messages and survey links should be thoroughly tested before any survey invitations are sent to potential respondents. Send test messages to as many different types of e-mail addresses as possible and to potential respondents with a variety of different browsers and Internet systems. Along with those test messages, send links to test surveys on the survey website. This, again, will ensure that as many respondents as possible receive the message, access the online survey using the link provided, and complete the survey.

Conclusion

This article presents a Model for Online Survey Development and Implementation for conducting online survey research. Critical to survey development is the need to conduct an extensive literature review to serve as the foundation in the development of research questions and for construct development. Survey research is an effective research methodology that can contribute to the fields of HRD and AE by both supporting existing theory and practice and by creating new directions for both fields. All survey instruments should be pilot tested to ensure the highest degree of validity and reliability. Both the Schmidt (2004a) and the Strachota (2003) survey instruments were showcased to demonstrate the importance of pilot testing and factor analysis.

Due to the technological age in which we live, online survey research may become the preferred delivery method over mail and telephone survey distribution. Before deciding to conduct survey research online one must be aware of the audience to be surveyed, their computer skill level, and their access to a computer and Internet.

Online survey research is far more appealing to the researcher who may have time or financial restrictions. Knowledge and application of online survey software and technology is required for this methodology. The efficiency and cost effectiveness of conducting online survey research, however, far outweighs the time and efforts required to learn and effectively utilize a specific software program application.

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